CLAIMS

[31020787 US]

1. Apparatus for providing a controllable impedance at a reference plane in a circuit, comprising:

a unidirectional transmission line loop having first and second input/output terminals, the first input/output terminal being connected to the reference plane;

amplifying means located in the transmission line loop to amplify signals passing in a direction from the second input/output terminal to the first input/output terminal; and

a variable tuned circuit coupling the second input/output terminal to a terminating device.

2. The apparatus of claim 1, wherein the terminating device comprises a matched-impedance load.

3. The apparatus of claim 1, where in the terminating device comprises a signal generator.

4. The apparatus of claim 1, wherein the transmission line loop comprises two circulators each of which has two adjacent ports coupled to two adjacent ports of the other circulator.

5. The apparatus of claim 1, wherein a bandpass filter is located in the transmission line loop.

6. The apparatus of claim 5, wherein the bandpass filter is located in series with the amplifying means.

7. The apparatus of claim 1, wherein an attenuator is located in the transmission line loop.

8. The apparatus of claim 7, wherein the attenuator is located to attenuate signals passing in a direction from the first input/output terminal to the second input/output terminal.

9. A method of providing a controllable impedance at a reference plane in a circuit, comprising the steps of:

connecting the reference plane to a first input/output terminal of a unidirectional transmission line loop which also has a second input/output terminal;

amplifying signals passing through the transmission line loop in a direction from the second input/output terminal to the first input/output terminal; and

controlling a variable tuned circuit coupling the second input/output terminal to a terminating device.

10. The method of claim 9, including the step of bandpass filtering the signals passing through the transmission line loop in the direction from the second input/output terminal to the first input/output terminal.

11. The method of claim 9, including the step of attenuating signals passing in a direction from the first input/output terminal to the second input/output terminal.